U. S. ENVIRONMENTAL PROTECTION AGENCY
Washington, D.C. 20460

OFFICE OF
PREVENTION, PESTICIDES
AND TOXIC SUBSTANCES

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MEMORANDUM

SUBJECT: **Environmental Fate and Effects Division Risk Assessment for the Section 3 New Use Registration of Tetraconazole**
PC Code: 120603
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This memo transmits the attached Environmental Fate and Effects Division (EFED) Environmental Risk Assessment for the Section 3 New Use Registration of tetraconazole. Tetraconazole is a broad-spectrum systemic fungicide with protective, curative, and eradicative properties. The proposed action pertains to the new use of tetraconazole (Mettle 125ME) on grapes at a maximum single application rate of 0.04 lb a.i./A with a minimum interval of 14 days and a maximum annual application rate of 0.08 lb a.i./A. In addition, it is proposed that the number of applications to pecans (on which tetracoanzole was already registered) be reduced from 8 applications to 4 per year at a maximum annual rate of 0.50 lbs a.i. (Eminent 125SL). The maximum single application rate for pecans is 0.125 lbs a.i/A with a minimum interval of 14 days between applications.

Results of the aquatic assessment for the proposed new uses of tetraconazole indicate that there is no potential risk to aquatic species based on applications to grapes and pecans. Toxicity data was not submitted for aquatic non-vascular plants, therefore there is uncertainty in risk to these species; however RQs are an order of magnitude less than the LOC for vascular aquatic plants, so risk to non-vascular aquatic plants is not expected.

This screening level assessment indicates the greatest concerns for tetraconazole application to grapes and pecans are based on acute and chronic risks to birds and mammals. The number of applications to pecans was reduced from eight to four applications. However, at the reduced number of applications, risk conclusions have not changed for pecans. There is still acute and chronic risk to birds and chronic risk to mammals. However, there is no risk to terrestrial plants and invertebrates.

Table 1 summarizes the areas of potential concern for direct and indirect effects to federally-listed threatened or endangered plants and animals (listed species).

Table 1. Listed Species Risks Associated With Direct or Indirect Effects Due to Applications of Tetraconazole.

Listed Taxonomy	Direct Effects	Indirect Effects
Terrestrial and semi-aquatic plants – monocots	No	Yes [e]
Terrestrial and semi-aquatic plants – dicots	No	Yes [e]
Terrestrial invertebrates	No	No
Birds	Acute and Chronic	Yes [c, d]
Terrestrial phase amphibians	Acute and Chronic [b]	Yes [c, d]
Reptiles	Acute and Chronic [b]	Yes [c, d]
Mammals	Chronic	Yes [c, d]
Aquatic vascular plants	No	No
Aquatic non-vascular plants [a]	No	No
Freshwater fish	No	No
Aquatic phase amphibians	No	No
Freshwater crustaceans	No	No
Estuarine/marine Mollusks	No	No
Estuarine/marine crustaceans	No	No
Estuarine/marine fish	No	No

[a] At the present time no aquatic non-vascular plants are included in Federal listings of threatened and endangered species. The taxonomic group is included here for the purposes of evaluating potential contributions to indirect effects to other taxonomy and as a record of exceedances should future listings of non-vascular aquatic plants warrant additional evaluation of Federal actions.
[b] Risk to terrestrial phase amphibians and reptiles was estimated using birds as surrogates. Risk to aquatic-phase amphibians was estimated using freshwater fish as surrogates.
[c] Acute and Chronic LOCs exceeded for some feeding guilds and size classes of birds.
[d] Chronic LOC exceeded for some feeding guilds and size classes of mammals.
[e] Indirect effects may be caused by plants that rely on affected mammals, birds, amphibians, and reptiles as pollinators.

Uncertainties and Data Gaps

Key Uncertainties and Information Gaps are as follows:

- Toxicity studies were not submitted for freshwater or marine algae. Thus, there is uncertainty regarding the potential for adverse effects resulting from exposure to tetraconazole in these aquatic species. Results of the aquatic assessment for the proposed new uses of tetraconazole on grapes and pecans indicate that there is no potential risk to aquatic species. Therefore, toxicity to aquatic vascular plants is not expected for these uses and a toxicity study is not requested at this time.

- An aerobic soil metabolism half-life was not calculated since tetraconazole was stable in soil over the course of a 52-week incubation period. Parent tetraconazole accounted for 82–82.5% of the applied radioactivity for both labels at 52 weeks posttreatment in one study (MRID 44367005). In another study (MRID 45851801), tetraconazole was only slightly degraded comprising 86.71–93.21% of the applied amount at study termination (100 days).

- To describe soil:water partition coefficient, the average K_{OC} values was used. The individual soil:water petition confidents (i.e. 1004, 769, 428 and 2036 L/kg) were based on an upgradeable supplemental adsorption/desorption study. None of the soil (German sand, German sandy loam, English clay, and English clay loam) used in the batch equilibrium study was the same type of soil that was used in the aerobic soil metabolism study (a sandy loam soil from Davidson, Georgia, MRID 44367005). One of the soils used in the batch equilibrium study had a very high organic matter content of 48.5% (K_{OC} = 2036 L/kg, K_{DL} = 580). A soil with such high organic matter content may not be representative of the agricultural soils in intended use areas and may not be an appropriate soil for assessing the mobility of the chemical in batch equilibrium studies. To address uncertainties in the risk assessment and satisfy the data requirements (Sec 3, March 2005), EFED requested a submission of a new guideline adsorption/desorption study (163-1).

- The foliar dissipation rate constant used in PRZM was obtained primarily from studies using sugar beets. It is uncertain whether or not this value is transferable to the other crops studied in this assessment. In addition, a study concluded that canopy interception may remove as much as 25% of the initially applied amount of tetraconazole available for runoff and erosion. Since canopy interception is difficult to account for in PRZM and is not likely to be consistent for all the crops studied, it was not included in the assessment.

- The risk assessment did not include tetraconazole degradates. Tetraconazole degradates were not analyzed in any of the terrestrial field studies. The registrant proposed degradation pathway suggests that tetraconazole (M14360) degrades to form M14360-di-fluoroacetic acid and M14360-alcohol, which further degrade to form M14360-acid and 1,2,4-triazole, respectively. In the soil photodegradation study 3.7% of 1,2,4-triazole was formed from tetraconazole at 112-days posttreatment. In the aqueous photolysis study 6.7% of 1,2,4-triazole was formed from tetraconazole at 30-days posttreatment. 1,2,4-

Triazole and its conjugates (triazole alanine and triazole acetic acid) are common metabolites to the class of compounds known as the triazoles (a.k.a. triazole-derivative fungicides, T-D fungicides, conazoles). A separate risk assessment was conducted on 1,2,4-trizole degradate. The Office of Pesticide Program's Health Effects Division (HED) has conducted aggregate human health risk assessments for 1,2,4-triazole and triazole conjugates which was completed on Feb 7, 2006 (D320683). The Tier II drinking water assessment for 1,2,4-triazole was completed in Feb 28, 2006 (D320682). The ecological risk assessment for 1,2,4-triazole was not performed.